ment of a series of papers entitled "Contributions from the Physical Laboratory of Harvard College," Prof. Trowbridge has a paper on the electro-motive action of liquids separated by membranes.—Prof. Marsh describes, under the name of *Hesperornis regalis*, his exceedingly interesting gigantic fossil swimming bird discovered in the cretaceous strata, which he considers to belong to the Palmipedes, and to be most nearly allied to the Columbidæ, but differing widely in many respects from that group and from all other known birds, recent and extinct. Both in this and the previous number are the usual interesting paragraphs of information arranged under the various natural sciences.

SOCIETIES AND ACADEMIES

LONDON

Zoological Society, May 21.—Mr. R. Hudson, F.R.S, vice-president, in the chair. The Secretary read a report on the additions that had been made to the Society's menagerie during the month of April, amongst which was a young female Baird's tapir (*Tapirus bairdi*) from Nicaragua, and a red-billed flying squirrel (*Pteromys magnificus*) from the Himalayas.—A letter was read from Dr. G. Bennett, of Sydney, N.S.W., giving particulars of the habits of a pair of *Didunculus strigirostris*, and of other birds living in the Botanic Gardens at Sydney. Dr. Bennett also mentioned that a pair of the red-billed curassow (*Crax carunculata*) had built a nest in one of the trees in the same gardens, and had hatched out two young birds, which at the time he wrote were doing well.—Sir Victor Brooke, Bart., read a paper on the royal antelope and allied species of the genus *Nanotragus*.—Mr. A. H. Garrod read some notes on the anatomy of the Huia bird (*Heteralocha gouldi*) as observed in a specimen that had lately died in the Society's gardens, and showed that this form must be referred to the family *Sturnidæ*.—A communication was read from the Rev. J. E. Semper, containing observations on the birds of St. Lucia, to which were added some notes on the species by Mr. P. L. Sclater.—A communication was read from Dr. J. E. Gray on the sea bear of New Zealand (*Arctocephalus cinereus*) and the North Australian sea bear (*Gypsiphoca tropicalis*).—A communication was read from Dr. A. Günther, F.R.S., containing a note on *Hyla punctata* and *Hyla rhodoporus*.—Mr. P. L. Sclater read a paper on the species of Quadrumana collected by Mr. Buckley in Ecuador, amongst which was a specimen of *Ateles fusciceps* Gray, from the western valleys of the Andes.—Dr. Murie read a paper on the osteology of the Tody (*Todus viridis*). He showed that this form comes under the group of *Coccygomorphæ* of Huxley, and does not belong to the Passeres (*Coracomorphæ*). Its nearest allies are the mot-mots and kingfishers, but it must stand as a group of itself (*Todidæ*), notwithstanding which it shows some osteological and other points of resemblance to fly-catchers (*Musicapidæ*).

Linnean Society, May 24.—Anniversary meeting.—The following were elected Officers and Conncil of the Society for the ensuing year:—President, Mr. G. Bentham, F.R.S.; Treasurer, Mr. W. W. Saunders, F.R.S.; Secretaries, Mr. F. Currey, F.R.S., and Mr. H. T. Stainton, F.R.S.; Council, Mr. A. W. Bennett, Mr. R. Braithwaite, M.D., Mr. G. Busk, F.R.S., Mr. J. Gwyn Jeffreys, F.R.S., Dr. J. D. Hooker, F.R.S., Mr. M. A. Lawson, Mr. H. Lee, Mr. R. McLachlan, Mr. J. Miers, F.R.S., Mr. D. Oliver, F.R.S., and Rev. Thos. Wiltshire.

Photographic Society, May 14—Mr. James Glaisher, F.R.S., president, in the chair.—A paper "On Photographic Pictures" was read by John Hubbard, in which the manner of elaborating his photographic studies was gone into at some length. His entire method of operating was described, which, however, differed little from that in ordinary use.—Lord Lindsay exhibited a series of transparent pictures of the last eclipse, five positives from every negative being shown, so as to afford an exceedingly clear representation of the phenomenon.—Major Tennant, R.E., also forwarded a series of eclipse pictures for exhibition to the members.

BRISTOL

Observing Astronomical Society.—*Sun.*—Mr. T. W. Backhouse writes that "there was a fine group of solar spots in the sun's northern hemisphere last month. On the 24th at 5^h there was a largish spot at the preceding end of the group, which on the 23rd, at 3^h, either was small or did not exist at all. On the 26th, about 4^h, its penumbra was 51,500 miles long, and its umbra 28,000, but it never became such a conspicuous umbra as the one which had all along been the largest in the group. On the 28th, at $4^h\ 15^m$, the penumbræ of the two were united, and 88,500 miles long, while at 20^h I found the penumbra to be 92,000 miles in length. It was then so close to the limb that I could not measure it accurately, the height being extremely foreshortened."—*Jupiter.*—Mr. H. W. Hollis, of Newcastle, Staffordshire, reports that on January 14, 9^h, the disc of the planet appeared very sharp, and he counted twenty-two different bands of colour. "Those visible in the equatorial parts of a beautiful, delicate, pinky brown. I am certain that the belts are visible up to the very edges of the disc, but there is an apparent increase of brightness for a considerable distance round the edge of the planet—probably an effect of contrast—which obliterates the extremities of the belts, unless carefully looked for. Several well-marked and beautifully-defined irregularities in the belts showed the rotation most clearly even in half an hour's watching. Jan. 23, $8^h\ 15^m$.—Satellite I. just entered on disc of Jupiter, and appears as an intensely white spot. $9^h\ 20^m$.—Shadow of I. on centre of disc, black, and sharply circular; the satellite itself cannot be seen." Mr. T. W. Backhouse, of Sunderland, observed the transit of Satellite I. on Jan. 14. At $13^h\ 54^m$ it "appeared as a faint white spot." On Feb. 3, $6^h\ 7^m$, he examined Satellite III., and its shadow when in transit. The satellite itself was, at the time mentioned, nearly half across Jupiter, on a darkish belt. "It is much darker than the darkest part of the planet." At $7^h\ 30^m$ it was "still very plain, but only the same shade as the darkest part of Jupiter. It was smaller than its shadow, which was very black." *T. Coronæ Borealis.*—Mr. T. W. Backhouse says:—"A change has taken place in this star. On its fading the second time it became stationary in brightness about the middle of the year 1867, since which time, up the beginning of this year, it continued the same, but with frequent slight fluctuations, which however ceased, so far as I could judge, at the end of 1869. I have suspected fluctuations since 1869, but they were doubtful. On January 14 this year I looked at the star and found it about its usual brightness, or perhaps a little fainter, but certainly not fainter than it had been at times previously. I did not look at it again till March 5, when I found it much fainter than I ever saw it before, perhaps half a magnitude less than usual, and it was the same on the following day." *Nebula in the Pleiades.*—Mr. H. W. Hollis has looked for this nebula with his 8 in. achromatic, but cannot find it. He says:—"There is something peculiar about all the brighter stars of this group, which for months past have appeared to me as if surrounded with nebulous light. Can the nebula have been distributed amongst them?" *Meteors.*—The Rev. S. J. Johnson, of Crediton, witnessed the appearance of "a splendid meteor at $7^h\ 37^m$ April 6. Its course was in a straight line downwards from about 15° above the N.W. horizon to about 5°. Colour, white with a greenish tinge. Duration, about 5″. Seen against a dark sky, this meteor would have equalled, if not exceeded, the brightness of Venus or Jupiter. I was looking for Mercury at the time." On April 19, $11^h\ 10^m$, Mr. William F. Denning, of Bristol, saw a brilliant meteor. It passed slowly down the N.N.E. sky. It was starlike in appearance, and left no train of light. *Mercury.*—The Rev. S. J. Johnson observed Mercury both with the naked eye and telescope on the evenings of March 25 and April 5. A power of 100 on a small telescope brought out the phase.

CAMBRIDGE

Philosophical Society, April 29.—Mr. Paley, "On certain effects of Light on Portland Stone." The author said that he doubted from the mode in which this occurred whether the blackness of stone seen in towns was due simply to smoke; the black scraped from the stone was unaffected by soap or solution of soda, and presented under the microscope an appearance quite different from that of ordinary soot.—By Prof. Miller, "On Faye's method of comparing Mètres à Traits, and an improvement of it suggested by Prof. Miller."—By Mr. Bonney, "On certain lithodomous Burrows in the Carboniferous Limestone of Derbyshire." The author said that doubts having been thrown upon the accuracy of his statement of the occurrence of these burrows in Miller's Dale, he had again visited the spot, had found his description correct, and had discovered a large number of these burrows in Miller's Dale and in Tideswell Dale. From the positions in which he found them, he was more than ever convinced they were the work of *Helices*.

May 13.—"On a Method proposed by M. Fizeau for comparing a a *mètre à bouts* with a *mètre à traits*," by Prof. Miller.—"On the Section exposed at Roslyn Hill Pit, Ely," by Mr. Bonney. The author stated that there were two hypotheses which accounted for the singular collocation of boulder clay, cretaceous rocks, and Kimmeridge clay in this pit; the one attributing it to a fault, the other to a boulder-like mass of cretaceous beds which had been dropped there in the Boulder clay time. He exhibited plans and sections, and pointed out that the faulting would be of such a singular and exceptional kind that this hypothesis appeared to him in the highest degree improbable. The choice remained between regarding the cretaceous beds as brought on by an ice-raft, or the result of a slip from beds subsequently removed by denudation, and on the whole he preferred the former of these.

EDINBURGH

Royal Society of Edinburgh, May 20.—Prof. Sir Robert Christison, Bart., president, in the chair.—The Keith Prize for the Biennial period ending May 1871 having been awarded by the Council to Prof. James Clerk Maxwell for his paper "On Figures, Frames, and Diagrams of Forces," which has been published in the Transactions, the medal was delivered to him by the President at the commencement of the meeting.—The Neill Prize for the Triennial period ending 1871 has been awarded by the Council to Prof. Turner for his papers "On the Great Finner Whale," and "On the Gravid Uterus and the Arrangement of the Fœtal Membranes in the Cetacea," which have been published in the Transactions.—The following communications were read:—"Some Helps to the Study of Scoto-Celtic Philology," by the Hon. Lord Neaves, V.P.—"Some Observations on the Dentition of the Narwhal (*Monodon monoceros*)," by Prof. Turner.—"On the Occurrence of *Ziphius cavirostris*, got from Hillswick, Shetland, in the Shetland Seas, and a comparison of its cranium with that of *Mesoplodon Sowerbyi*," by Prof. Turner.—"On the Maternal Sinus System of the Human Placenta," by Prof. Turner.

HALIFAX, NOVA SCOTIA

Institute of Natural Science, December 11, 1871.—The vice-president, Dr. Gilpin, in the chair. The vice-president read the concluding paper of a series on the mammals of Nova Scotia, including the moose deer. Dr. Gilpin described its peculiar form, differing from all mammals by the length of its cannon bones (metacarpal and metatarsal), whilst in the shortness of its neck, its great height, its prehensile lip, it had a singular analogy with the equatorial form of the elephant, the giraffe, and the tapir, yet it more resembled certain large wading birds. It might be called a wading mammal, in summer resorting to the swamps and shallow lakes, in winter its long cannon bones allowing it to walk in the deep snow. It thus becomes straddling and weak-footed. In comparing its hind leg with that of the greyhound and hare, the swiftest animals known, its form would be found exactly opposite. He described its nuptial suit in September (its rutting season) of glossy black, and golden tan legs, and its wintery livery of shaggy grey hair. Its identity with the elk of Sweden was discussed, and from observations in the R. C. Surgeons' Museum, Sir John Richardson, and especially from Captain Hardy, R.A., who compared his sketches, notes, and measurements, of the moose of Nova Scotia, personally, with a pair of young elks from Sweden at Sandringham, Dr. Gilpin concluded them to be identical. Allowing them to be identical, then, as their fossil bones have been found in the Upper Tertiary formations in America, and not yet in the Old World, the moose must be held as the primitive type. Dr. Gilpin thought that, with the carriboo, its form must have existed contemporarily with many forms now extinct; that, perhaps, it was one of the earliest existing fauna that succeeded the glacial epoch in Nova Scotia, and that from some cause now existing this earliest fauna may be destined to be the last. From the almost entire identity of the boreal marine fauna, the marine birds, and the fish, the more we study the arctic forms, the more we are impressed with the conviction that we must look to the north for the common type of many of our temperate and equatorial forms. The shaggy elephant of Lorna, and the rough musk ox of the Pole, and the hairy-coated carriboo, may each have been the primal type of the naked-skinned elephants and buffalos of Asia and the satin-skinned African deer, whilst the coatis may equally have been the type of all foxes and dogs to the hairless race in Turkey. In a conversation that ensued it was maintained that two varieties existed in the province, but Dr. Gilpin considered them not permanent varieties. To show the numbers still extant, the game book of a gentleman present gave, from the year 1863, twenty-seven, whose death he had been in at, and ninety-seven which he had seen altogether.

CALIFORNIA

Academy of Sciences, San Francisco, November 6, 1871.—Dr. T. Blake, president, in the chair.—Mr. Harford stated that he had examined some Indian graves on San Miguel island, from two of which he had obtained a number of relics. The pits were about 25 ft. long, 5 ft. deep, and situated at an elevation of about 80 ft. above the sea. In one of the pits there were from 75 to 100 skeletons, most of the skulls showing marks of violence. No order had been observed in the burial, children and adults, male and female, all lying together. The other pit seemed to be of a much older date, as the bones were in a more advanced state of decay, and only stone beads or trinkets were found there, whereas in the other principally glass and shell beads were found. Large shell heaps were of common occurrence on the island, showing that at one time they must have been inhabited, although no Indians had been known to live on the island since the settlement of the country by the Spaniards.—Prof. Davidson, of the United States Coast Survey, remarked that as a rule in the entrances to the harbours and rivers on our coast the channels all tended to the N.W., the northern headlands showing bold rocky bluffs, the southern points, on the other hand, forming long low sandy beaches. He said his own observations had been confirmed by information received from Lower California, thus showing that there is a strong inshore northerly current along the entire coast.

December 4.—The president, Dr. Blake, in the chair. Prof. Whitney exhibited a collection of fossils made by Mr. J. E. Clayton in Nevada, near the 116th meridian, and not far from the mining settlement of Eureka. These fossils are very interesting as representing the Primordial or Potsdam period of the Silurian, and exhibiting the same combination of genera and species of the *Lingulidæ* family of the brachiopods, and the *Paradoxidæ* family of trilobites, which is so characteristic of this group farther east. Indeed there are no families represented in these specimens but these two. The trilobites are very imperfect, much broken, and crowded together in great numbers in the rocks. The same *Agraulos* (*Arionellus* of Barrande, and *Crepicephalus* of D. Owen, Meek, and Hayden), which occurs in the Big Horn Mountains, about longitude 167°, is found in this lot from the 116th meridian. There is also a *Conocoryphe* (Conocephalites); but the *Agraulos* is much the most abundant. The brachiopods appear to be represented by at least two genera, *Lingulepis* (Lingula) and *Obalella*. The lithological character of the rock in which these fossils occur is of importance, as it is not a sandstone, but a limestone. The Primordial or "Potsdam sandstone" fossils have not, previously to this discovery, been found to the west of the Big Horn mountains, so far as appears from any published documents. The discovery is therefore an interesting one, and will furnish a valuable datum-point for working out the geology of the Great Basin.—Mr. Montrange read a paper on White Island on the coast of New Zealand. Whakari, as the Maoris call it, is White Island, is situated in the Bay of Plenty, on the east coast of New Zealand (North Island). Hours before reaching it, one sees the large crest of vapour which crowns its summit. It is of very difficult access, and very few even of the oldest settlers have ever visited it. The whole of the island is one perpetually active crater, which, like the mollusc that secretes its little shell, has built up its huge cone, three and a half miles in circumference at the base, 860 feet high, of scoriæ and indurated ashes. The walls of the cone are straight, cut at intervals with deep longitudinal furrows; the crater is inside, on the eastern side.—Prof. Marsh, of Yale College, who was present at the request of the President, made some remarks on the results of his trip from Nebraska and Dacota across the continent to Eastern Oregon. He stated that the extensive fresh water deposits that had been found in Nebraska and Dacota were again met with in Eastern Oregon, extending, in fact, across the continent. The Oregon beds were as rich in new and interesting fossil remains as those on the eastern sides of the Rocky Mountains. During his trip across the continent, he had selected a large number of vertebrates, amongst which were thirty or forty species, which he considered entirely new. The family *Equidæ* were represented by several new species, furnishing important material for tracing the development of the group through its intermediate forms. Another interesting fact in connection with these fresh water deposits is, that whilst the fossil fauna of Eastern Oregon abounds in species identical or analogous with those of Nebraska and Dacota, yet extensive fresh water deposits were met with in Wyoming and the centre of the continent in which the fossil fauna was of an entirely distinct character, although belonging to the same geological epoch, the Miocene.

PARIS

Academy of Sciences, May 13.—M. Chasles presented a further series of theorems relating to the theory of the obliques of a curve—M. L. Cailletet communicated a note on the influence of pressure upon the bands of the spectrum, in which he describes the increased resistance offered by compressed gases to the passage of the electric spark and its influence on the luminous phenomena produced, and stated that whilst the luminous intensity of the bands of the spectrum is increased by pressure, when the latter is extreme they disappear entirely, the spectrum becoming continuous.—M. Melsens forwarded a memoir on lightning conductors with multiple conductors; and M. Decharme a note on the spontaneous ascensional movement of liquids in capillary tubes, compared with the flow of the same liquids in the same tubes under a constant artificial pressure.—A note was read by M. Arnould Thenard on the decomposition of carbonic acid under the influence of electricity.—M. Balard presented a note by M. Amagat on the dilatation of moist gases.—M. Lamy commented on a recent note by M. Personne on the presence of selenium in sulphuric acid of French manufacture, and indicated that its existence had been known for the last ten years.—M. Wurtz also presented a note by M. Scheurer-Kestner upon the same subject.—A note was read by M. J. Boussingault on the determination of carbon combined with meteoric iron.—M. C. Robin communicated a note by M. H. Byasson on the hydrosulphate of chloral (sulphuretted chloral).—M. Bouchut presented some investigations on the action of the bases and alkaloids obtained from opium.—M. Robin presented a note by M. J. P. Megnin, on the development of the unarmed cestoid worms, in which he described his observations on an undetermined species allied to *Tænia perfoliata* (Goeze), *T. plicata* (Rud.), and *T. mamillaria* (Mehlis), discovered by M. Baillet and himself in the horse and mule. He seems to think that all the stages of development of this parasite are passed in the same animal.—M. Clos presented a note upon a portion of the leaf in certain plants, to which he gives the name of *prelimb*.—The Minister of Foreign Affairs communicated a report received from the French Consul-General at San Francisco, relating to an earthquake which occurred in the county of Inyo on March 30.—A note on the silicified plants of Autun, with observations on the structure of *Dictyoxylon*, by M. B. Rénault, was presented by M. Brongniart.—A letter from M. Palmieri on the late eruption of Mount Vesuvius, dated May 5, was read.

VIENNA

Academy of Sciences, January 4.—Prof. L. Gegenbauer, of Krems, forwarded a second memoir on the evaluation of definite integrals.—Dr. F. C. Schneider noticed the production of a detonating iodine-compound by treating oxyiodide of mercury with solution of iodide of potassium containing iodine. The detonating compound was formed as a crust over the residue of oxyiodide and upon the sides of the glass in which the mixture had remained for a fortnight; its violently explosive qualities were discovered on an attempt being made to remove it by means of a glass rod.—M. J. Schlesinger deposited a sealed note on the formula for the rapidity of outflow of water from tubes.—Prof. von Oppolzer announced the re-discovery on December 20, 1871, of the lost planet Ægina (91).—Dr. Sigmund Exner presented a memoir entitled "Further Investigations on the Structure of the Olfactory Mucous Membrane in the Vertebrata," in which he showed that the branches of the olfactory nerve in birds, mammals, and in man, terminate in the same way as was previously described by him in the frog. The author regarded the glands of the olfactory region as tubular, and not acinose.—Dr. A. Boué communicated a reply to M. Blaek's remarks on his catalogue of northern and southern lights, and M. H. Fritz forwarded a note relating to the same subject.

January 11.—Dr. L. J. Fitzinger communicated a memoir on the natural family of the Pangolins (*Manes*), and M. S. Adler some mathematical demonstrations connected with the game of dominoes.

January 18.—A memoir by D. A. Seydler on the path of Dione (106) was read.—Dr. F. O. Sofka communicated six short papers on various mathematical and physical subjects.

BOOKS RECEIVED

ENGLISH.—Introduction to the Study of Palæontological Botany: J. H. Balfour (A. and C. Black).—Fruit Trees, 2nd edition: W. Wardle (Lockwoods).—Nature: A. Walker (Longmans).—The Fallacies of Darwinism: C. R. Bree, M.D. (Longmans.)

AMERICAN.—Annual Record of Science and Industry for 1871, edited by S. F. Baird.—The Lens, edited by S. A. Briggs, vol. i., No. 2.

DIARY

THURSDAY, MAY 30.

ROYAL SOCIETY, at 8.30.—The Bakerian Lecture: On the Structure and Development of the Skull of the Salmon: W. K. Parker, F.R.S.—On Ammonia in the Urine in Health and Disease: Dr. Tidy and Dr. Woodman.—The Structure and Functions of the Rods of the Cochlea: Dr. Pritchard.—Examination of the Gases occluded in Meteoric Iron from Virginia: Dr. J. W. Mallet.

SOCIETY OF ANTIQUARIES, at 8.30.—Ballot for the Election of Fellows.

FRIDAY, MAY 31.

ROYAL INSTITUTION, at 3.—Old and New Art: E. J. Poynter.

SATURDAY, JUNE 1.

ROYAL INSTITUTION, at 3.—On the Chemical Action of Light: Prof. Roscoe, F.R.S.

GOVERNMENT SCHOOL OF MINES, at 8.—On Geology: Dr. Cobbold, F.R.S.

MONDAY, JUNE 3.

ROYAL INSTITUTION, at 2.

ENTOMOLOGICAL SOCIETY, at 7.

ANTHROPOLOGICAL SOCIETY, at 8.—On the Artificial Enlargement of the Earlobe in the East: J. Park Harrison, M.A.—On the Westerly Drifting of Nomads—the Fins: H. H. Howorth, M.A.—On Tumuli at Sapolia, Russia: Baron de Bognschefoky.

VICTORIA INSTITUTE, at 8, Anniversary Meeting.

TUESDAY, JUNE 4.

ROYAL INSTITUTION, at 3.—On Development of Belief and Custom E. B. Tylor, F.R.S.

ZOOLOGICAL SOCIETY, at 9.—On Dinornis (Part XIX.) containing a description of a Femur, indicative of a new genus of large wingless bird (*Dromornis australis*, Owen) from a post-tertiary deposit in Queensland, Australia: Prof. Owen, F.R.S.—On the Anatomy of the Two-spotted Paradoxure (*Nandinia binotata*): Prof. Flower.

SOCIETY OF BIBLICAL ARCHÆOLOGY, at 8.30—On the Political Condition of Egypt before the Reign of Rameses III.: Dr. August Eisenlohr.—Some Mathematical Observations on the Dimensions of the Base of the Great Pyramid, and the Royal Coffer: Solomon M. Drach.—The XXXVII. Aamu in the Tomb of Chnum-Hotep, at Beni Hassan, identified with the Family of Israel: Daniel H. Haigh.

WEDNESDAY, JUNE 5.

GEOLOGICAL SOCIETY, at 8.—Notes on Sand-pits, Mud Volcanoes, and Brine-pits, met with during the Yarkand Expedition of 1870: Dr. G. Henderson.—On the Cervidæ of the Forest-bed of Norfolk and Suffolk: W. Boyd Dawkins, F.R.S.—The Classification of the Pleistocene Strata of Britain and the Continent by means of the Mammalia: W. Boyd Dawkins, F.R.S.

MICROSCOPICAL SOCIETY, at 8.—Remarks on the Homological Position of the members constituting the Thecated Section of the Rotatoria: Chas. Cubitt.—On a Micro-pantograph: Isaac Roberts.

THURSDAY, JUNE 6.

ROYAL INSTITUTION, at 3.—On Heat and Light: Prof. Tyndall, F.R.S.

SOCIETY OF ANTIQUARIES, at 8.30.

LINNEAN SOCIETY, at 8.

CHEMICAL SOCIETY, at 8.

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